



**City of Santa Barbara**  
Parks and Recreation Department

**Memorandum**

**DATE:** April 20, 2011

**TO:** Creeks Restoration/Water Quality Improvement Program  
Citizen Advisory Committee

**FROM:** Jill Murray, Creeks Research Coordinator

**SUBJECT:** **SOUTHERN COASTAL SANTA BARBARA CREEKS  
BIOASSESSMENT PROGRAM AND 2011 REPORT**

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COMMITTEE DIRECTION – FOR DISCUSSION

The Committee will receive an update on the Southern Coastal Santa Barbara Creeks Bioassessment Program and a summary of the 2010 Report.

DISCUSSION

Background

Bioassessment is the study of the biological community of a body of water to help assess the health of the water. The Creeks Division Research and Monitoring Program uses bioassessment to compare the condition of different creek locations, track water quality changes over time, and follow progress of creek restoration projects. Bioassessment is also used to help understand impacts of development, climate variation, and wildfire on water quality and habitat conditions in Santa Barbara creeks.

Bioassessment can be considered the third tier of analysis for understanding water quality concerns. The first tier, field sampling, measures concentrations of specific chemicals that are known to harm aquatic organisms. The second tier, toxicity testing, measures the response of a laboratory test organism (often juvenile fish) to creek water samples, thereby summing the impacts of any toxic chemicals that may be present at the time of sampling. The third tier, bioassessment, quantifies the community of benthic invertebrate (BMI) organisms present in the creek to determine if water quality is impaired. Bioassessment effectively integrates the effect of potential contaminants over a period of time. Pristine sites are known to have high numbers of sensitive organisms, such as mayflies, whereas impaired sites have a higher number of organisms, such as midges, that are known to be more tolerant of pollutants.

Since 2002, the Creeks Division has utilized the services of Ecology Consultants, Inc to conduct the field sampling, laboratory analysis, and statistical calculations required to complete bioassessment monitoring. The results are used by the consultant to generate an Index of Biological Integrity to simplify comparisons among locations and time points. Several creek sites have been monitored every year since 2001 (the County of Santa Barbara funded the 2001 study), whereas other sites have been tested for a subset of years in response to specific research questions. For the past two years, results from the City and County studies have been combined in one report for the South Coast.

The Creeks Advisory Committee received a presentation on the method of bioassessment in March 2003. Annual bioassessment reports have been made available online ([www.sbcreeks.com](http://www.sbcreeks.com)) and results have been summarized in recent Creeks Division Water Quality Monitoring and Research Reports, also available on the Creeks Division website. The Committee has approved the Annual Water Quality Research and Monitoring Plan, which has included a bioassessment component, for the past several years.

With the large amount of bioassessment data now available for tracking creek health, this is an appropriate point for the Committee to receive an update from Jeff Brinkman (Ecology Consultants, Inc) on the program and results. Attached is the Executive Summary of the 2010 Bioassessment Report, prepared by Ecology Consultants, Inc. The entire report is available on the Creeks Division website.

### Budget

The Creeks Division has contracted with Ecology Consultants, Inc to complete sampling and analysis at twelve creek sites and two estuarine sites in April and May 2011, for a cost of \$17,000. Sufficient funds exist in the Water Quality Lab Sampling account to complete the contract.

cc: Cameron Benson, Creeks Manager  
Jill E. Zachary, Assistant Parks and Recreation Director